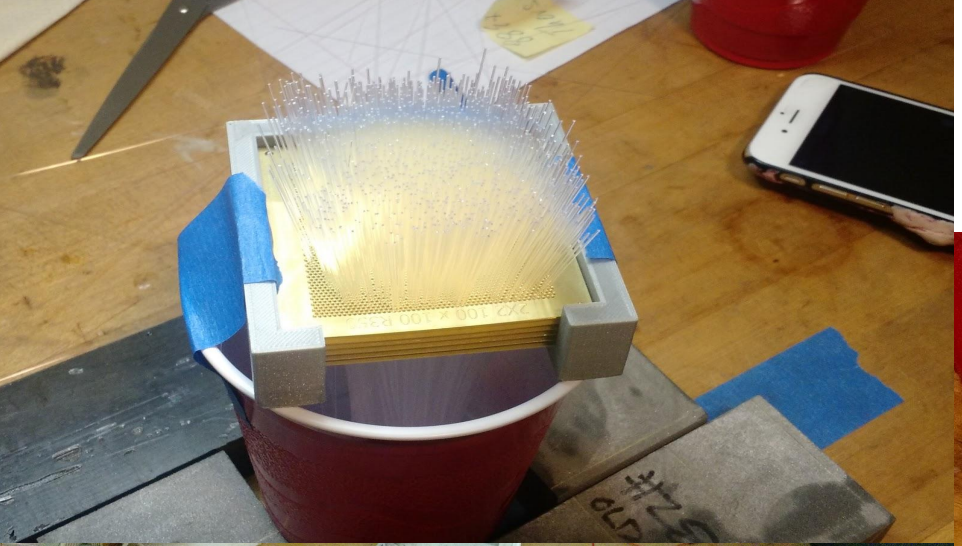
# 2D Module Progress Report

Anne Sickles, Eric Thorsland, Virginia Bailey,
Michael Higdon, Peter Sobel

- Cut Fibers: 170mm-172mm in length per fiber
- 3020 fibers per mesh set



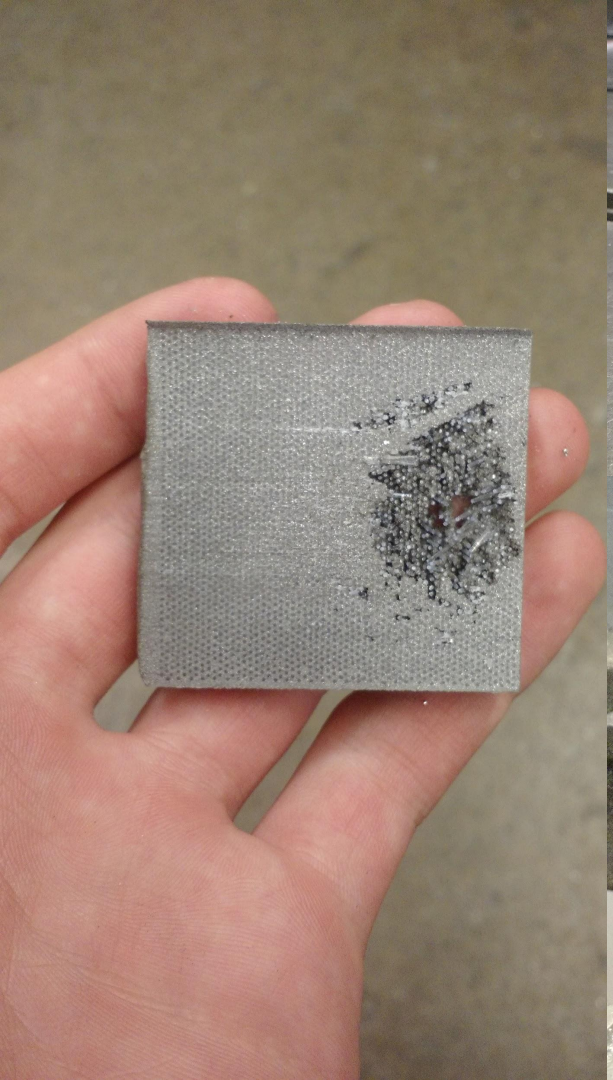
Filling 2:

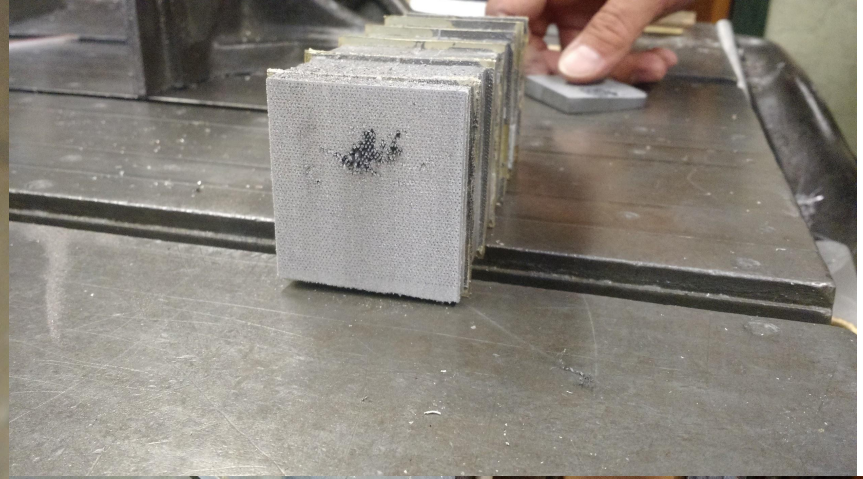
- No bottom holes plugged
- Let gravity pull the epoxy down (no vacuum)

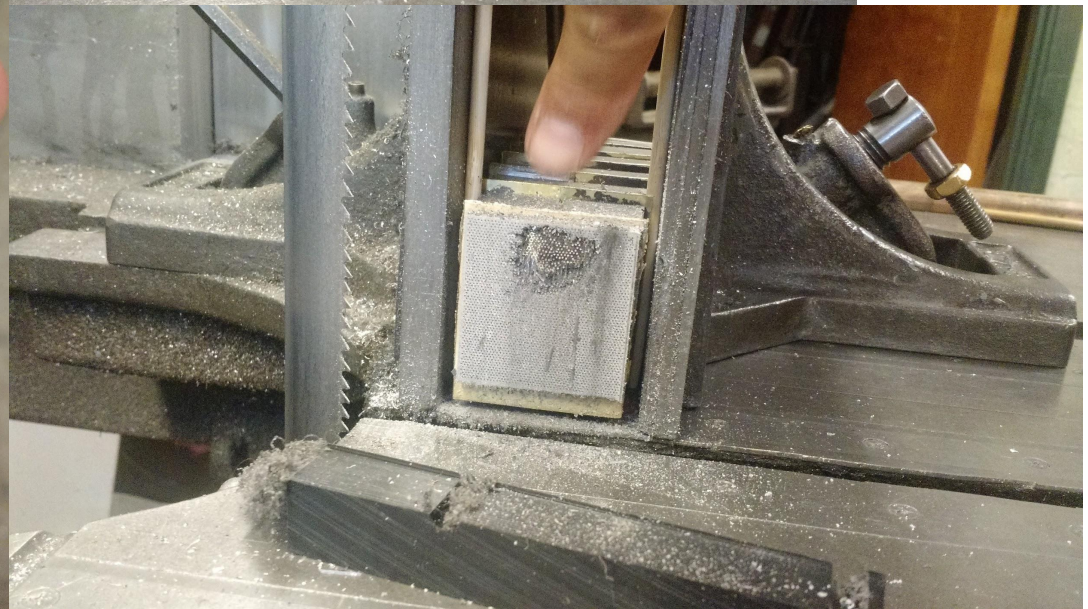
- ~4kg tungsten (2 cups of 2kg, slowly pour cup one with vibration pad on high, fill rest with second cup)
- 2 cups of 100 grams epoxy each (20 from dark brown bottle, 80 from larger white bottle +2 min stir job)
- Orange tubing for epoxy leakage

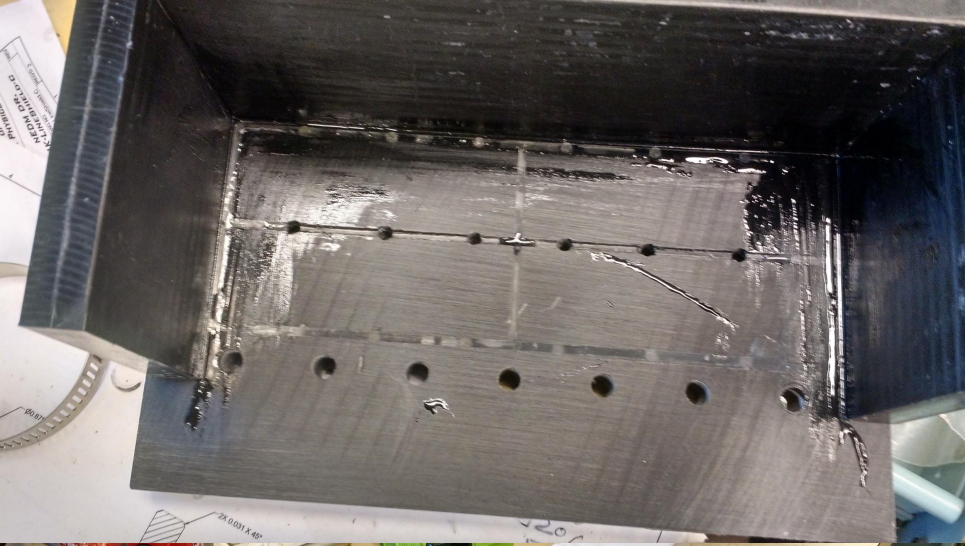
Excavation of Filling 2:

- Dry spots on the ends of the module (shown in next slide)







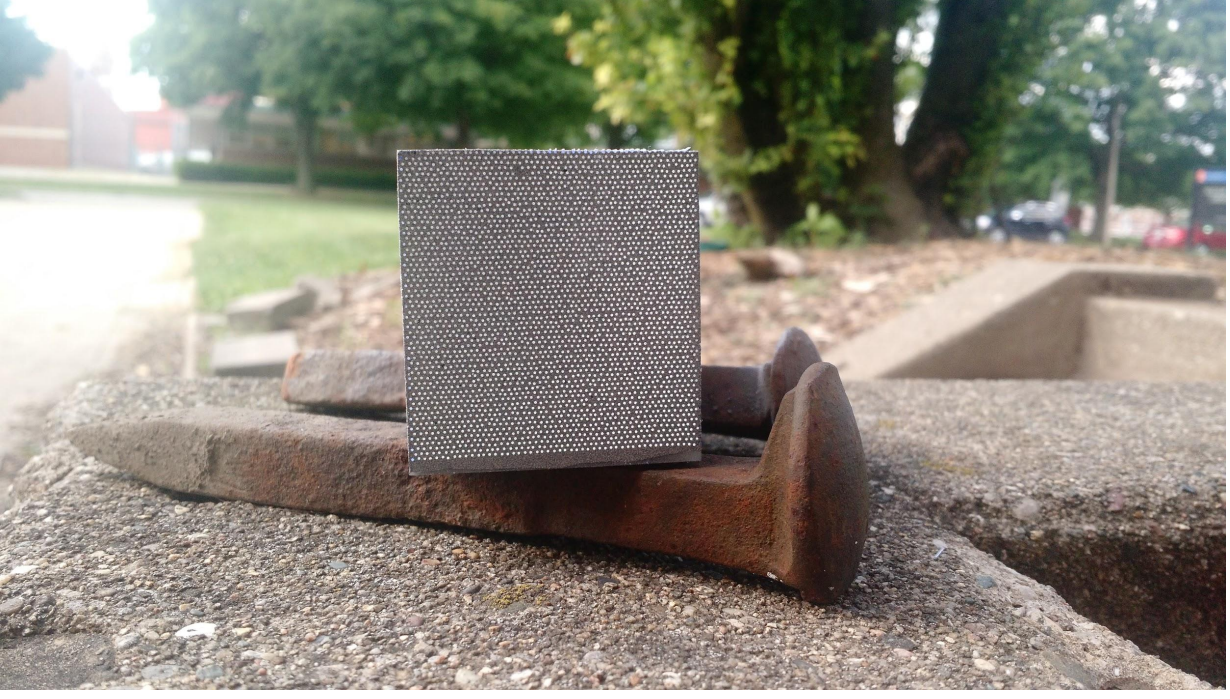



The Mold:

- For Filling 3, plan to plug the outermost 4 holes on the bottom to improve epoxy flow

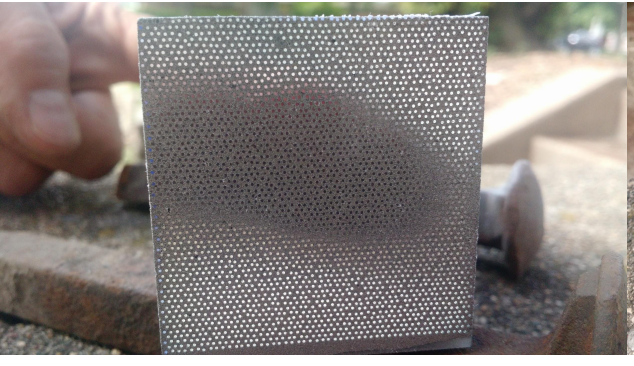
Filling 3:

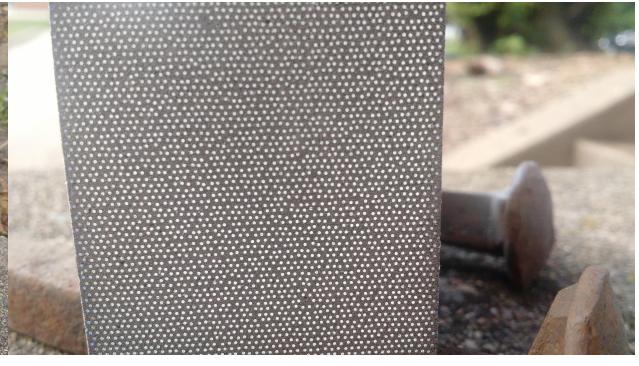
- No dry spots on the ends
  - Means the flow of epoxy improved after covering the outer holes
- Dry spots on larger faces however
- Can be fixed with a patch job



Filling 3:

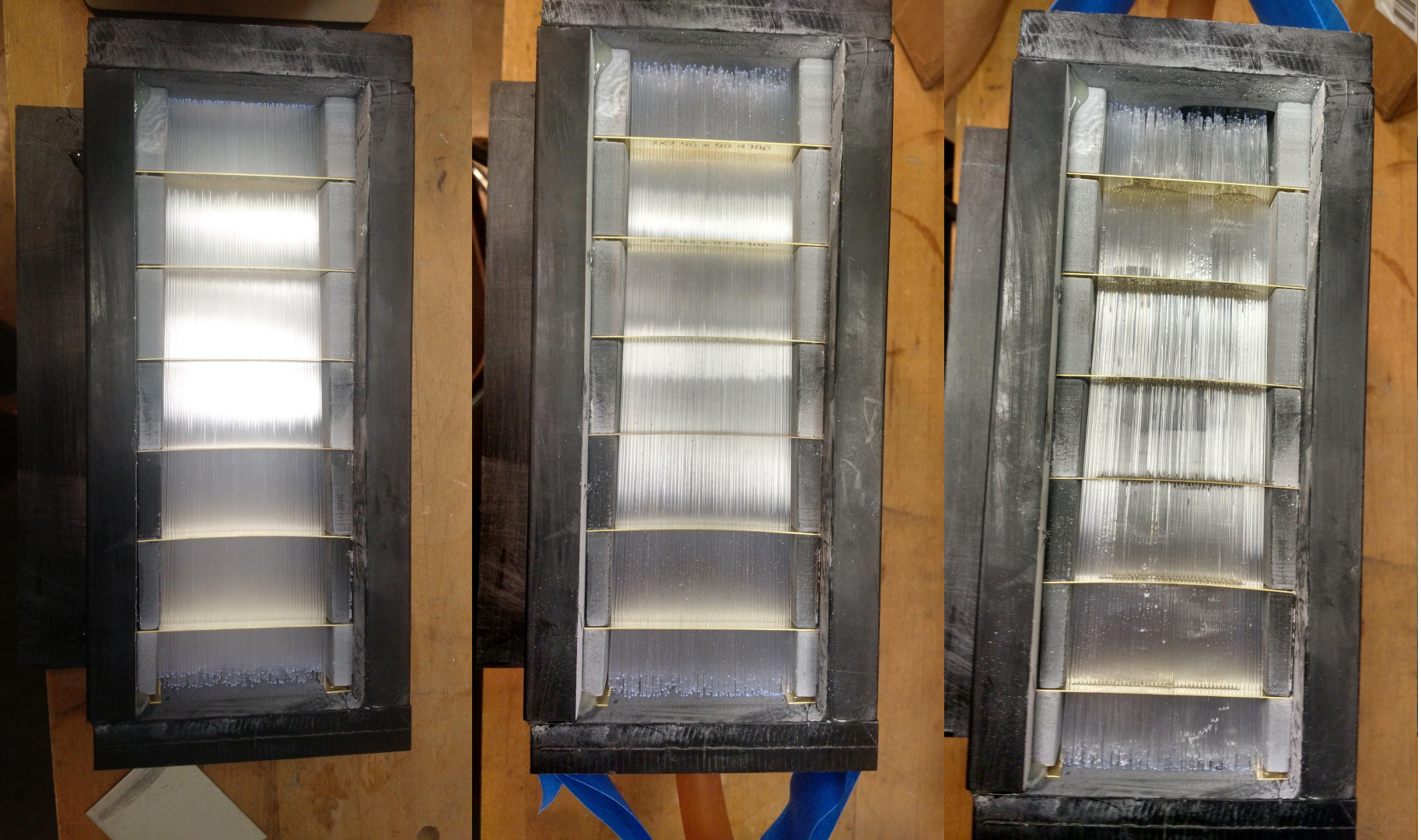
- Post patch job
- Good fill quality
- Noticeable projection from small to large end





# Filling #4

- Fill Mold layer by layer:
  - One Layer of 1kg Tungsten
  - One Layer 50g Epoxy Mix
  - ...
- In total the filling used:
  - 4kg tungsten
  - 250g epoxy (more than previous fillings)
- Constantly on vibrating pad (high)





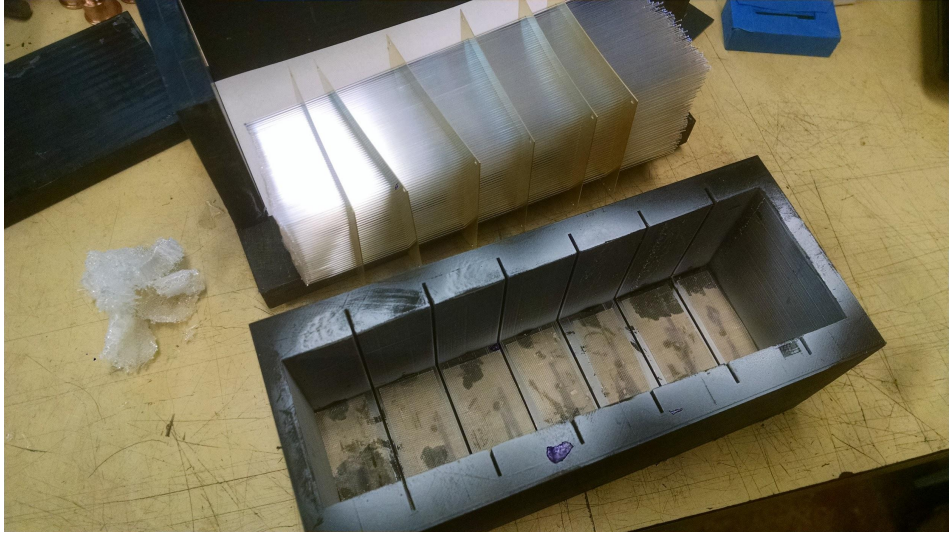


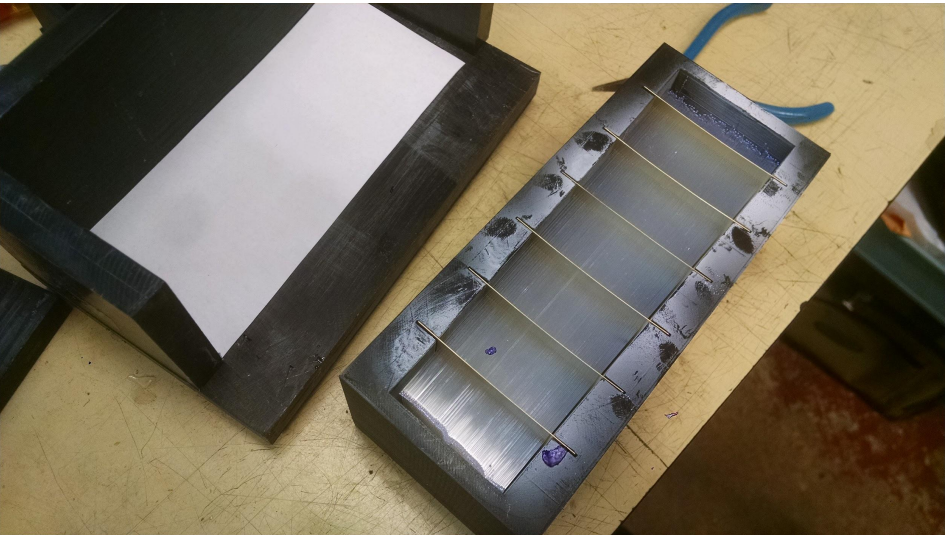
Filling 4:

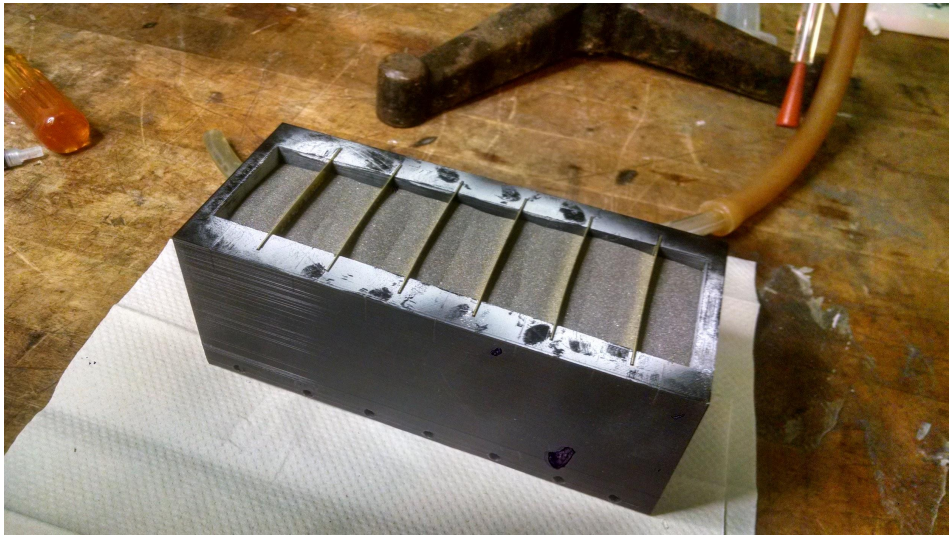
- Several dry spots, warped edges, exposed fibers

Filling 5:

- Used a 1-piece mold
- This design would ideally improve the coverage of epoxy within the module
    - No gaps for the epoxy to find and fill
- 80 hr print job

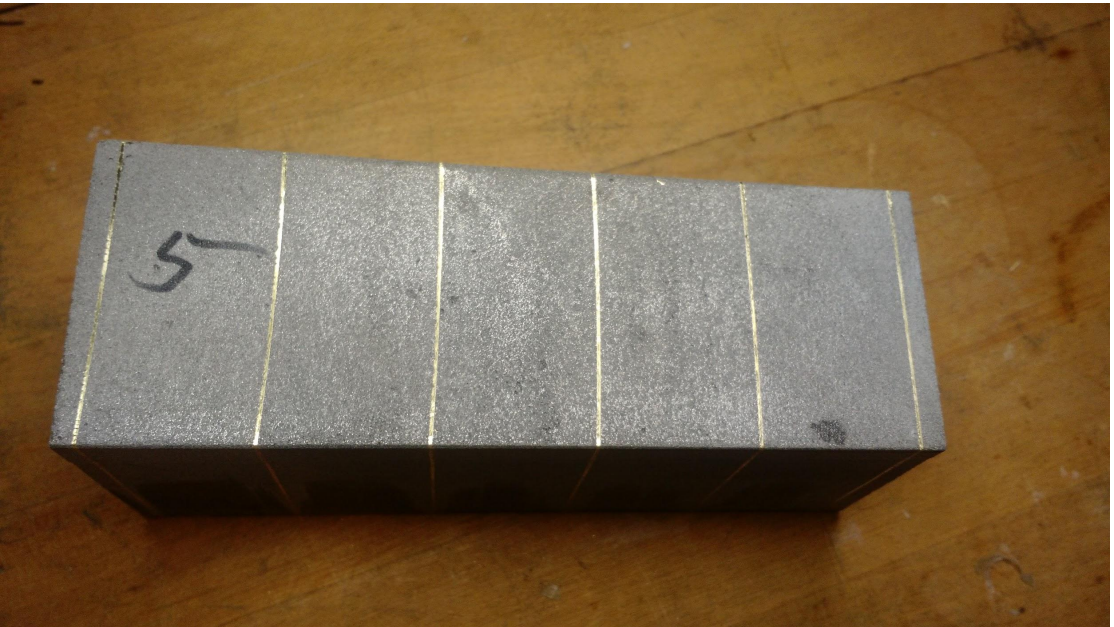


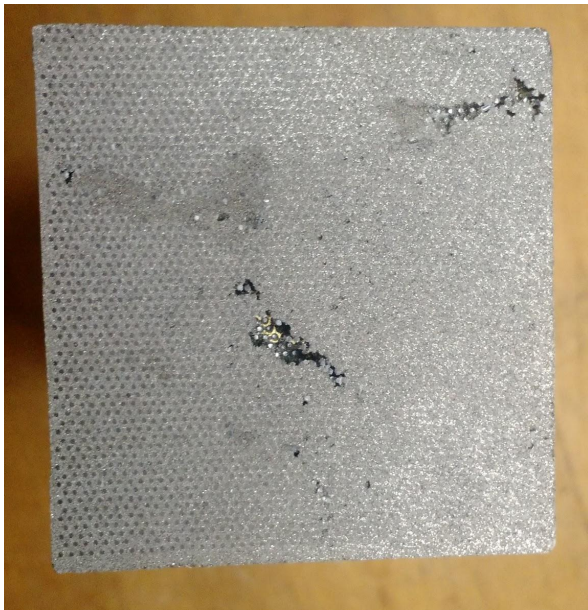




Filling 5:

- Dry spots on one side
- Otherwise good quality module
- Still can improve the one-piece mold



# Our Plan

- R&D for the mold:
  - Improve quality of mold
  - Eliminate possibility of dry spots
  - Decrease manufacture time for module
    - Alter mold design to decrease print time
- The procedure:
  - Test methods of filling
  - Experiment with new ingredients to improve epoxy flow